

APPLICANT(S): BARTLETT, Philip Nigel  
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### AMENDMENTS TO THE CLAIMS

Please amend and add the following claims to read as follows:

1. (Currently Amended) An electrochemical cell comprising a cathode, an anode and an electrolyte, wherein, [the] said cathode comprises mesoporous nickel comprising having a periodic arrangement of substantially uniformly sized pores of cross-section [of] in the order of  $10^{-[8]9}$  to  $10^{-[9]8}$  m; and [the] said anode comprises a mesoporous material having a periodic arrangement of substantially uniformly sized pores of cross-section [of] in the order of  $10^{-[8]9}$  to  $10^{-[9]8}$  m, ~~and selected from:~~ said anode made of carbon, cadmium, iron, a palladium/nickel alloy, an iron/titanium alloy, palladium or a mixed metal hydride.
2. (Currently Amended) An electrochemical cell according to ~~any preceding~~ claim 1, wherein [the] said mesoporous structure of [the] said cathode comprises nickel and an oxide, hydroxide or oxy-hydroxide of nickel selected from NiO, Ni(OH)<sub>2</sub> and NiOOH, said nickel oxide, hydroxide or oxy-hydroxide forming a surface layer over said nickel and extending over ~~at least~~ the pore surfaces.
3. (Currently Amended) An electrochemical cell according to ~~any preceding~~ claim 1, wherein [the] said mesoporous structure of [the] said cathode is comprised of ~~comprises a metal selected from:~~ nickel[;] or alloys of nickel, ~~including nickel alloys with a transition metal, nickel/cobalt alloys and iron/nickel alloys.~~
4. (Currently Amended) An electrochemical cell according to ~~any preceding~~ claim 1, wherein [the] said mesoporous structure has a pore diameter in ~~within~~ the range [from] of about 1 to about 10 nm, ~~preferably from 2.0 to 8.0 nm.~~
5. (Currently Amended) An electrochemical cell according to ~~any preceding~~ claim 1, wherein [the] said mesoporous structure has a pore number density [of] from about  $4 \times 10^{11}$  to about  $3 \times 10^{13}$  pores per cm<sup>2</sup>, ~~preferably from  $1 \times 10^{12}$  to  $1 \times 10^{13}$  pores per cm<sup>2</sup>.~~
6. (Currently Amended) An electrochemical cell according to ~~any preceding~~ claim 1, wherein at least 85 % of the pores in [the] said mesoporous structure have pore diameters [to]

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within 30 %, ~~preferably within 10 %, more preferably within 5 %~~, of the average pore diameter.

7. (Currently Amended) An electrochemical cell according to ~~any preceding~~ claim 1, wherein [the] said mesoporous structure has a hexagonal arrangement of pores that are continuous through the thickness of the electrode.
8. (Currently Amended) An electrochemical cell according to claim 7, wherein [the] said hexagonal arrangement of pores has a pore periodicity [of] in the range [from] of 5 to 9 nm.
9. (Currently Amended) An electrochemical cell according to ~~any preceding~~ claim 1, wherein [the] said mesoporous structure is a film having a thickness in the range [from] of about 0.5 to about 5 micrometers.
10. (Currently Amended) An electrochemical cell according to ~~any preceding~~ claim 1, wherein said anode ~~the negative electrode~~ comprises ~~a material selected from~~ carbon [and] or palladium.
11. (Currently Amended) An electrochemical cell according to ~~any preceding~~ claim 1, wherein [the] said mesoporous structure of said cathode ~~the positive electrode~~ comprises nickel and an oxide, hydroxide or oxy-hydroxide of nickel, ~~selected from NiO, Ni(OH)<sub>2</sub> and NiOOH, said nickel oxide, hydroxide or oxy-hydroxide~~ forming a surface layer over said nickel and extending over at least the pore surfaces, and wherein said anode ~~the negative electrode~~ has a mesoporous structure [of] comprising carbon or palladium.
12. (New) An electrochemical cell according to claim 3, wherein said nickel alloys are nickel alloys with a transition metal, nickel/cobalt alloys or iron/nickel alloys.
13. (New) An electrochemical cell according to claim 4, wherein said pore diameter is in the range of about 2.0 to about 8.0 nm.
14. (New) An electrochemical cell according to claim 5, wherein said pore number density is in the range of about  $1 \times 10^{12}$  to about  $1 \times 10^{13}$  pores per  $\text{cm}^2$ .
15. (New) An electrochemical cell according to claim 6, wherein at least 85 % of the pores have pore diameters within 10% of the average pore diameter.

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16. (New) An electrochemical cell according to claim 6, wherein at least 85 % of the pores have pore diameters within 5% of the average pore diameter.

17. (New) An electrochemical cell according to claim 11, wherein said oxide, hydroxide or oxy-hydroxide of nickel is NiO, Ni(OH)<sub>2</sub> or NiOOH.